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Application of antiretroviral drug resistance testing in the New York City public health laboratory

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Background: As part of the overall effort in the Ending the AIDS Epidemic (ETE) program in New York State, the Public Health Laboratory (PHL) at NYC Department of Health and Mental Hygiene (DOHMH) launched HIV-1 Genotyping testing in June 2016 for DOHMH Sexual Health clinic patients with a new diagnosis of HIV. Availability of the testing will roll out to include all newly diagnosed patients city-wide throughout the next year. The significance of this implementation is to provide real-time viral sequence data and clinical anti-viral drug resistance data to public health epidemiologists and clinicians respectively. Phylogenetic analyses will be used to prioritize field response and provide guidance in disease management.

Method: Tests were performed according to the ViroSeq HIV-1 Genotyping System 2.0 (CELERA/Abbott Molecular) kit instruction. Viral sequences were analyzed using ViroSeq HIV-1 Genotyping Software v3.0 (CELERA/Abbott Molecular) to detect HIV-1 antiretroviral drug resistance-associated mutations. Wherever applicable, subtypes of HIV-1 viral sequences were identified using HIVseq program hosted by Stanford University's HIV Drug Resistance Database.

Results: From June 2016 to February 2017, NYC PHL performed ViroSeq HIV-1 genotyping test on 172 confirmed HIV-1 positive specimens. 151 specimens (87.8%) were sequenced and reported successfully. The subtype distribution of these specimens is: A (n=1), B (n=135), C (n=3), B+C (n=1), CRF01_AE (n=2), CRF02_AG (n=6), CRF07_BC (n=1), CRF12_BF (n=1) and 28_BF (n=1). In successfully sequenced and reported specimens, 27 specimens (15.7%) contained HIV-1 antiviral drug resistance mutations in protease and/or reverse transcriptase region that conferred antiviral drug resistance.

Conclusion: In support of the ETE program in NYC, NYC PHL began offering HIV-1 antiretroviral drug resistance testing in June, 2016. The test provides essential phylogenetic and clinical data to public health epidemiologists and clinicians in NYC respectively, enabling the NYC PHL to play an important role in the NYS ending the AIDS epidemic campaign.

Biography

Rui Gu has completed her PhD from University of Connecticut and Post-doctoral studies from Wadsworth Center. She is a Research Scientist and the Group Leader in the NYC PHL HIV Phylogenetic Unit. She is the first author of 6 papers in reputed journals.

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